

ABSTRACT

In therapeutic endoscopy micro-knives, electrical diathermy or laser beam replace the conventional hand-held scalpel. The laser "knife" has substantial capabilities over the rest: it can cut incisions, coagulate hemorrhages and ablate (vaporize) neoplastic tissues, while interaction is contact-less and sterile. The laser energy is delivered transendoscopically through rigid or flexible fiberoptic waveguides. Flexible endoscopes are used to access body curved spaces and cavities, such as the digestive tract.

A control system for minimally invasive surgery, and more particularly, for laser surgery using infrared laser is provided. A feedback mechanism is provided to obtain thermographic information from the targeted site and a processor uses this thermographic information to monitor and control input parameters, including air flow, suction, and laser beam parameters. Furthermore, an infrared imaging fiber bundle is used in combination with an infrared camera to provide the thermographic information to the processor.

Specifically, the system and methods provided can be used to more effectively present very specific wavelengths of laser treatment, with capability of monitoring its effects and altering parameters at the time of treatment. Furthermore, means for thermographic analysis of the targeted area, wherein such analysis provides a guideline for the monitoring and altering of the controllable parameters is provided.